

**SPIN VALVE SENSOR FREE LAYER STRUCTURE  
WITH A COBALT BASED LAYER THAT PROMOTES  
MAGNETIC STABILITY AND HIGH MAGNETORESISTANCE**

**ABSTRACT OF THE DISCLOSURE**

5           A method of making a nickel iron (NiFe) layer and a cobalt or cobalt based  
layer of a free layer structure forms the cobalt or cobalt based layer by oblique ion  
beam sputter deposition with the cobalt or cobalt based layer located between the  
nickel iron (NiFe) layer and a copper (Cu) spacer layer of a spin valve sensor for  
reducing hard axis coercivity  $H_{CH}$  which increases sensitivity and magnetic stability of  
10   a magnetic read head. An alpha iron oxide ( $\alpha\text{FeO}$ ) layer on a nickel oxide (NiO)  
layer of a pinning layer may also be obliquely ion beam sputtered for improving  
magnetic stability of the read head.